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10/607,801

06/27/2003

Qinghua Li

42P16725

6519

8791

7590

03/09/2005

BLAKELY SOKOLOFF TAYLOR & ZAFMAN  
12400 WILSHIRE BOULEVARD  
SEVENTH FLOOR  
LOS ANGELES, CA 90025-1030

EXAMINER

CAO, HUEDUNG X

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/607,801

**Applicant(s)**

LI ET AL.

**Examiner**

Huedung X. Cao

**Art Unit**

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/03/05</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindsay et al. (6,085,076).

As per claim 1, Lindsay teaches the claimed method, comprising: receiving a signal by multiple antennas (Lindsay, column 7, lines 36-49), and "sequentially evaluating signals from the multiple antennas to ascertain an antenna providing a higher

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signal quality than other antennas, wherein the evaluation is based on symbols in the preamble" (Lindsay, column 9, lines 43-55). It is noted that Lindsay does not explicitly teach "a preamble" included in the received signal as claimed. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure Lindsay's method as claimed because in telecommunication, a preamble is always included in the received signals and used to synchronize the received signals.

Claim 2 adds into claim 1 "wherein receiving the preamble further comprises: receiving a frame that is transmitted by an 802.11 station, where the frame includes the preamble which contains a known training sequence" which Lindsay does not explicitly teach. However, it would have been obvious to use any transmitting station such as 802.11 to transmit a known training sequence for the preamble because its efficiency and popular in the telecommunication network.

Claim 3 adds into claim 1 "demodulating the signals in a single receiver chain to generate quadrature signals; and comparing the quadrature signals to determine which of the multiple antennas provides the higher signal quality" which Lindsay teaches in the correlation score for the receiving preamble to an initial preamble which are in form of quadrature signals (column 11, lines 42-57).

Claim 4 adds into claim 1 "receiving a preamble by multiple antennas further includes receiving the preamble by at least three antenna" which Lindsay teaches in column 8, lines 51-60, and column 9, lines 42-55.

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Claim 5 adds into claim 1 “comparing the antenna having the higher signal quality with the other antennas, one by one, to dynamically determine the antenna having the higher signal quality” which Lindsay teaches in column 12, lines 10-20.

Claim 6 adds into claim 1 “incorporating the multiple antennas with a single receive chain on a Network Interface Card (NIC)” which Lindsay does not explicitly teach. However, it would have been obvious to implement Lindsay’s receiving circuit on a “Network Interface Card (NIC)” because it will reduce the space occupied by the circuit and simplify the manufacture of the receiving circuit.

Claim 7 adds into claim 1 “selecting one of the other antennas when the signal quality of that antenna is higher than the other antenna” which Lindsay teaches in column 12, lines 10-28.

As per claim 8, Lindsay teaches the claimed “method, comprising: controlling a switch to sequentially evaluate signals received by at least three antennas in a single receiver chain where the signals are symbols used to evaluate signal quality” (Lindsay, column 8, lines 52-62; column 9, lines 42-55, column 11, lines 42-58). It is noted that Lindsay does not explicitly teach “a preamble” included in the received signal as claimed. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure Lindsay’s method as claimed because in telecommunication, a preamble is always included in the received signals and used to synchronize the received signals.

Claim 9 adds into claim 8 “evaluating the signals received by the at least three antennas to compare the at least three antennas as to the signal quality” which Lindsay teaches in column 8, lines 52-62, column 9, lines 42-55, and column 12, lines 10-29.

Claim 10 adds into claim 9 “evaluating the signals further comprises comparing a first signal received by a first antenna with a second signal received by a second antenna to select the antenna that provides the higher signal quality” which Lindsay teaches in column 12, lines 10-29 in which the scores are compared between each receiver.

Claim 11 adds into claim 9 “placing the at least three antennas into a first tier group and a second tier group in accordance with the signal quality” which Lindsay does not teach. However, given Lindsay’s established scores for each receiver, it would have been obvious to rank them as first, second tier groups because the purpose of a score system and the priority of selected receiver according to their scores.

Claim 12 adds into claim 11 “comparing signals from one antenna in the first tier group with signals sequentially selected from antenna in the second tier group to determine which antenna has the higher signal quality” which Lindsay does not teach. However, given Lindsay’s established scores for each receiver, it would have been obvious to compare and rank them as first, second tier groups because the purpose of a score system and the priority of selected receiver according to their scores.

Claim 13 adds into claim 11 “exchanging antenna in the first tier group with antenna in the second tier group based on comparing signals, wherein the first tier group has antenna that provide a higher signal quality” which Lindsay does not teach.

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However, given Lindsay's established scores for each receiver, it would have been obvious to rank them as first, second tier groups because the purpose of a score system and the priority of selected receiver according to their scores.

Claim 14 adds into claim 13 "verifying an address in a packet" which Lindsay teaches in column 15, lines 8-22, column 29, lines 2-10.

Claims 15-18 claim a system based on the method of claims 1-14; therefore, they are rejected for the same reason.

### ***Response to Arguments***

4. Applicant's arguments filed on 12/09/2004 have been fully considered but they are not persuasive.

Applicant argues that Lindsay does not teach the preamble receives by multiple antennas is sequentially evaluated which is not correct. Lindsay teaches that a transmission or signals is received at all four antennas is processed in a parallel; however, Lindsay's all signals that received by an antenna are being processed one after another (Lindsay, column 9, lines 43-55) analogous to Applicant's claimed language.

Applicant argues that Lindsay does not teach that the signals received by the multiple antennas are demodulated in a single receiver chain which is not correct. Lindsay's signals received by the multiple antennas is processed by the receiver 805 (Lindsay, column 9, lines 43-46).

Hence, Applicant's claims 1-18 are taught by Lindsay et al. Therefore, 35 USC 103(a) rejection to claims 1-18 stands.

### ***Conclusion***

**5. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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***Inquires***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Huedung Cao  
Patent Examiner

*Shih-Chao Chen*  
**SHIH-CHAO CHEN**  
**PRIMARY EXAMINER**